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IFIP is the global non-profit federation of societies of ICT professionals that aims at achieving a worldwide professional and socially responsible development and application of information and communication technologies.

IFIP is a non-profit-making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees and working groups, which organize events and publications. IFIP's events range from large international open conferences to working conferences and local seminars.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is generally smaller and occasionally by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

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Luis M. Camarinha-Matos (Ed.)

Technological Innovation for Digitalization and Virtualization

13th IFIP WG 5.5/SOCOLNET
Doctoral Conference on Computing,
Electrical and Industrial Systems, DoCEIS 2022
Caparica, Portugal, June 29 – July 1, 2022
Proceedings

Editor

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Preface

This proceedings, which collects selected results produced in engineering doctoral programs, focuses on research and development in technological innovation for digitalization and virtualization. The ongoing 4th industrial revolution is characterized by an intense digitalization and digital transformation of all sectors of society. This encompasses the adoption and integration of a variety of new information and communication technologies to develop more efficient, flexible, agile, and sustainable solutions. Furthermore, the recent pandemic forced millions of people to work or study from their homes, which created an immediate challenge for organizations unprepared for this scenario. This led to a fast virtualization of daily interactions and the work environment. As a result, to effectively support digitalization and virtualization many different knowledge areas are coming together leading to the creation of various innovative technologies and tools, while also motivating new research directions.

The 13th Advanced Doctoral Conference on Computing, Electrical, and Industrial Systems (DoCEIS 2022) aimed at providing a venue for sharing and discussing ideas and results from doctoral research in various interrelated areas of engineering, while promoting a strong multidisciplinary dialogue. Furthermore, the conference aimed at creating collaborative opportunities for young researchers as well as effective ways of collecting valuable feedback from colleagues in a welcoming environment. As such, participants were challenged to look beyond the specific technical aspects of their research question and relate their work to the selected theme of the conference, namely, to identify in which ways their research topics can contribute to technological innovation for digitalization and virtualization. Furthermore, current trends in strategic research programs point to the fundamental role of multidisciplinary and interdisciplinary approaches in innovation. More and more funding agencies include this element as a key requirement in their research agendas. In this context, the challenge proposed by DoCEIS contributes to the process of acquiring such skills, which are mandatory in the profession of a PhD [1].

DoCEIS 2022, which was sponsored by SOCOLNET, IFIP, and IEEE IES, attracted 48 paper submissions from a good number of PhD students and their supervisors from 15 countries. This book comprises 22 works selected by the International Program Committee for inclusion in the main program and covers a good spectrum of application domains. As such, research results and ongoing work are presented, illustrated, and discussed in the following areas:

- Smart Systems Thinking
- Cyber-physical Systems
- Health-related Digitalization
- Electric Systems and Machines
- Smart Devices
- Control and Digital Platforms

We hope that this collection of papers will provide readers with an inspiring set of new ideas and challenges, presented in a multidisciplinary context, and that by their diversity these results can trigger and motivate richer research and development directions.

We would like to thank all the authors for their contributions. We also appreciate the efforts and dedication of the DoCEIS International Program Committee members, who both helped with the selection of articles and contributed valuable comments to improve the quality of papers.

April 2022

Luis M. Camarinha-Matos

Reference

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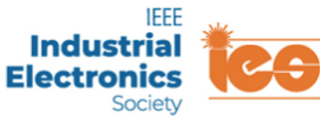
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